

# TTP 2000 Kiosk Printer

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## Service Manual



## Acknowledgments

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## REVISION HISTORY

Edition A: .

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**1****INTRODUCTION****1.1 About this manual**

This manual contains information required to repair the TTP 2000 printers.

**1.2 Updating**

This manual will be updated as, from time to time, printer functions and features may be added or amended. You will always find the latest edition on our web site (<http://www.swecoin.se>). You can order printed copies of the current manual by e-mail, fax, or phone.

If you require functions not found in the manual edition at your disposal, you are welcome to consult one of our representatives for information.

**1.3 Safety precautions**

Handling the printer in a safe way requires that you keep your fingers away from the cutting mechanism when the power is switched ON.

## 2 PRODUCT PRESENTATION

The TTP 2000 series are kiosk printers for 58 to 82.5 mm paper using direct thermal printing. It has integrated guillotine cutter, looping presenter with built in retract and retain function, and control board. The print speed is 150 mm per second, and the presenting speed 300 mm/s to ensure high throughput.

The printhead can easily be opened to give the operator access to the paper path, and print head, for maintenance purposes.

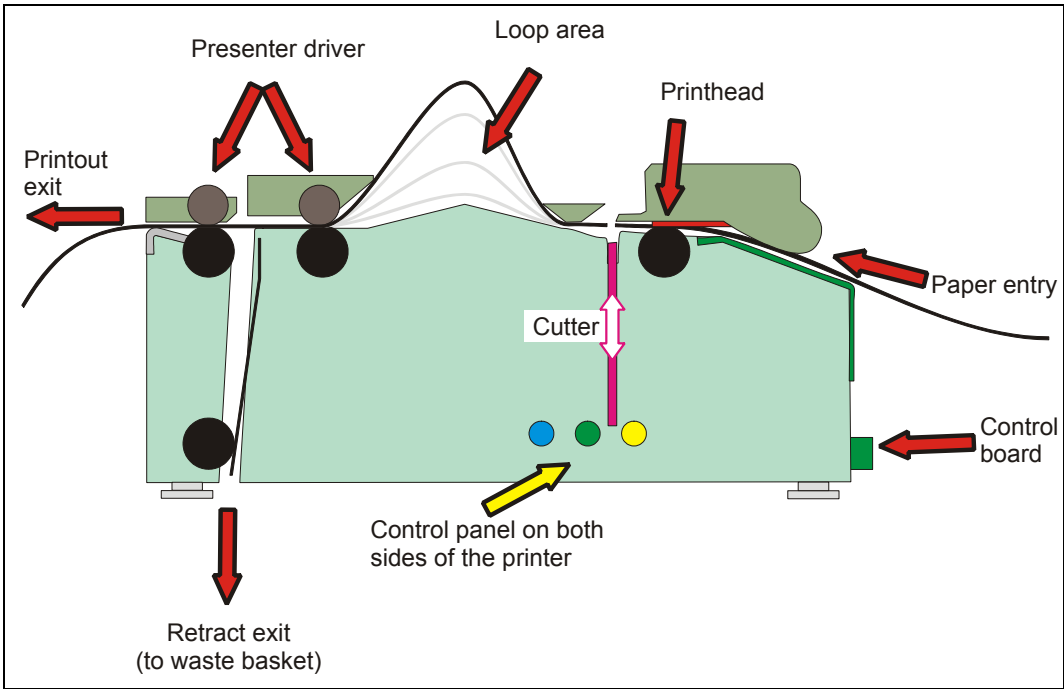


Figure 1 Principle of operation

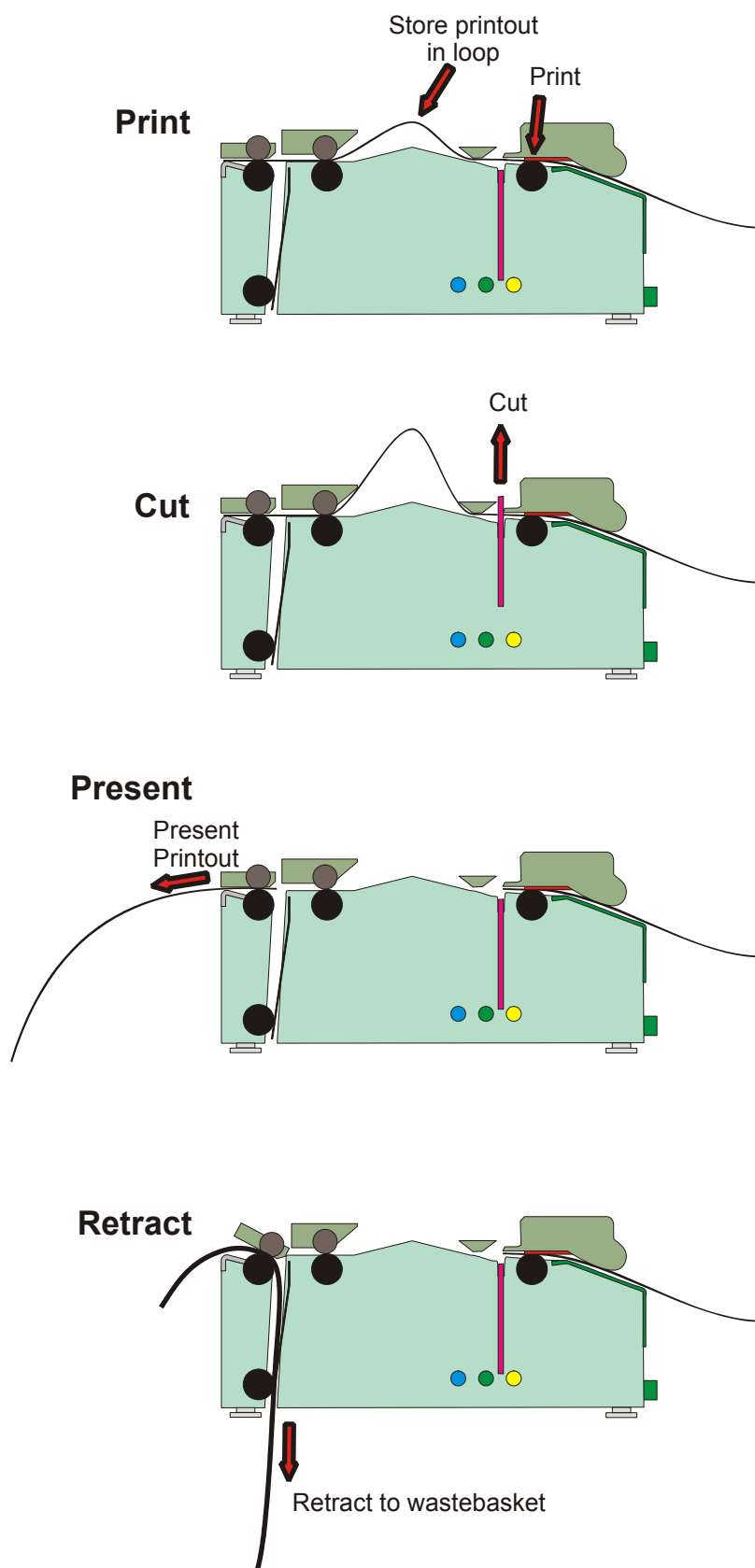
The capability of the control board differs between the versions of TTP 2000:

	TTP 2010	TTP 2020	TTP 2030
Interface	Serial	Parallel	USB

Printer drivers for Microsoft Windows™ and Linux are available, and the printer is compatible with the Plug and Play standard.

The text capability of TTP 2010 and 2020 makes it easier to print directly from the kiosk software without using a driver.

### 2.1.1 Looping presenter



The loop generating presenter mechanism has many benefits;

- It handles documents of various lengths by storing the printed paper in a loop.
- It holds the printout until fully printed and cut before presenting the completed printout to the customer.
- When presented, only a portion of the printout is ejected, and then when the customer pulls the paper the pull detector start the motor to eject the rest. You can also select to eject so that the very end of the printout is held by the printer, or eject it fully.
- The retract-and-retain function can retract uncollected printouts and throw them in a wastebasket inside the kiosk. Retracts are reported to the driver so any remaining data for that printout can be deleted.

Figure 2 The Swecoin looping presenter

## 2.2 Controls

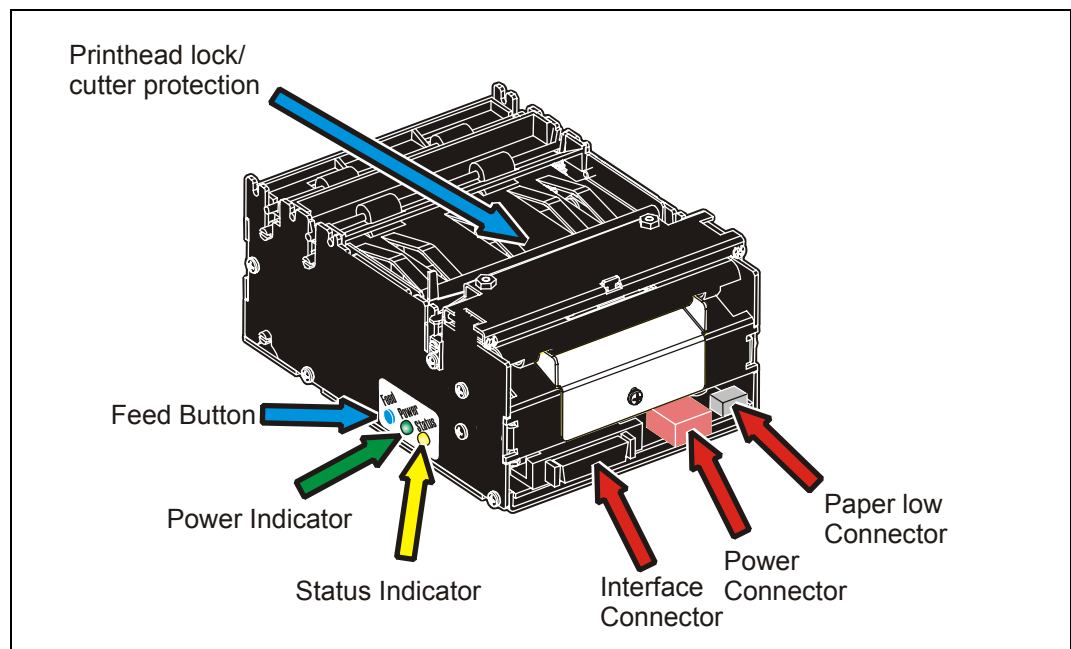


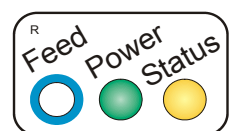
Figure 3 Rear view

The controls are duplicated on both sides of the printer so that they are easily accessible regardless of how the printer is installed.

### 2.2.1 Feed button

The **Blue** feed-button has several functions:

- Short press; eject printout from presenter
- Longer press; feed, cut, and present a complete page.  
Any data in the print buffer will be printed. If the buffer is empty the page will be blank.  
In black mark mode, the page will be synchronized with the black mark.
- Press and hold while turning on the power, or while opening and closing the printhead to print a self-test printout. See page 11.





### 2.2.2 Status indicator

 The status indicator has several functions:

**ON constantly** — the printer is operational

**Flashes rapidly** — indicates error. Hold down the feed-forward button and the number of blinks will reflect the *status-code*.

1	Presenter jam, paper cannot be ejected / retracted
2	Cutter cannot return to home position
3	Out of paper
4	Printhead lifted
5	Paper feed error (under head)
6	Temp error, printhead is above 60°C
7	Presenter jam, motor cannot rotate
8	Paper jam during retract
Fast flashes	Checksum error, firmware
Steady light	Wrong firmware type or target for firmware loading

Status-codes are reset:

- 1 When the conditions causing them are removed
- 2 When the printer is turned off/on
- 3 When the printhead is lifted and then lowered.

**Blink, blink, pause, blink, blink** — is the *warning-code* for paper low<sup>1</sup>  
The warning-code is reset automatically when the condition causing it is removed.

### 2.2.3 Voltage indicator

**24 V**

 Green indicator constantly ON: 24 V present

**5 V**

The electronics in the printer runs on 5 V. This voltage is generated from the 24 V supply by a switched mode regulator on the control board. If the green indicator lights up but the yellow status indicator stays off, this indicates problems with the 5V generation.

<sup>1</sup> This signaling is disabled by default. It can be disabled/enabled by setting parameter p52

## 3

**INSTALLATION****3.1 Installing a paper guide**

The paper guide selects if the printer should use 58, 60, 80, or 82.5 mm paper width. The printer senses what paper guide is fitted and adjusts to it automatically. The TTP 2000 printers are delivered without paper guide fitted.

1. Select the paper guide you want to install<sup>1</sup>
2. Open the printhead by pushing green printhead lock plate backwards and lifting up the printhead, see page 12.
3. Enter the T-shaped tab of the paper guide into the “T”-hole, and fasten the screw.
4. Close the printhead

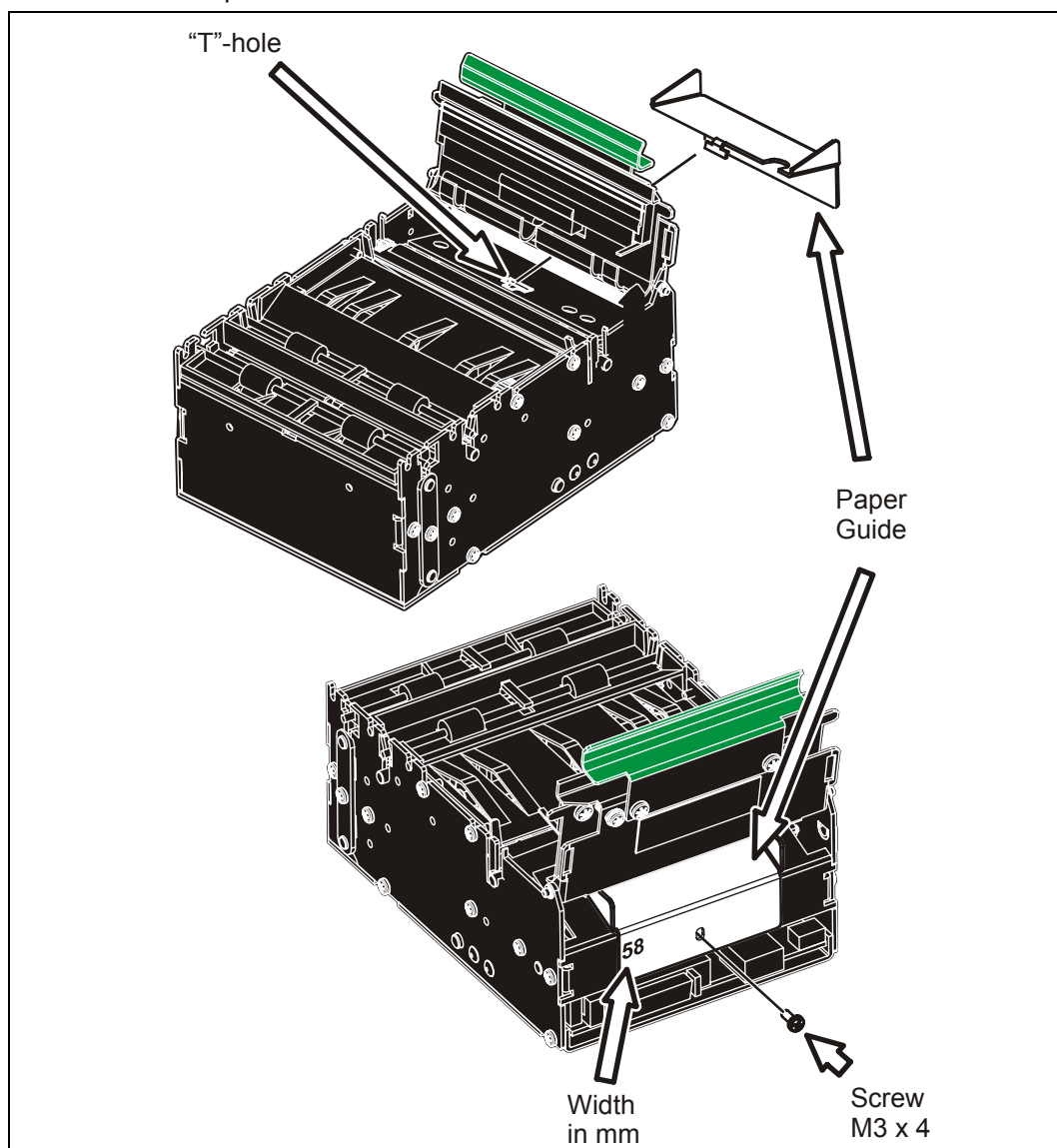


Figure 4 Fitting a paper guide

<sup>1</sup> Evaluation kits contain all input guides available. Regular volume deliveries only contain the appropriate guide for the customer in question.

### 3.2 Making a test printout

1. Load paper
2. Switch OFF the power.
3. Hold the feed-forward button depressed while powering ON the printer. Keep the button depressed until printing starts.

This produces a printout showing the firmware program version and date, control board revision number and serial number, name of loaded fonts and logotypes, and the parameter settings.

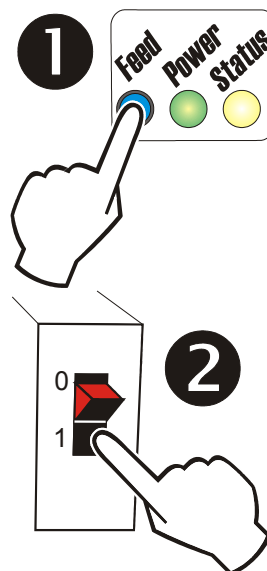
4. Each successive press of the button will produce a test printout.

Switch the printer OFF and ON again to exit self-test mode.

If a power button is not available for the printer, follow the below procedure:

1. Lift the printhead
2. Hold the FF-button pressed while lowering the head and hold it pressed while an auto load of paper is done
3. Release the button and a self-test printout will be printed
4. The printer exits self-test mode and goes on-line

## Self-test



### 3.3 Clearing paper jams

Should a paper jam occur, follow the procedure below:

Open the printhead by:

1. Press the green release lever toward the rear of the printer.
2. Lift the head.

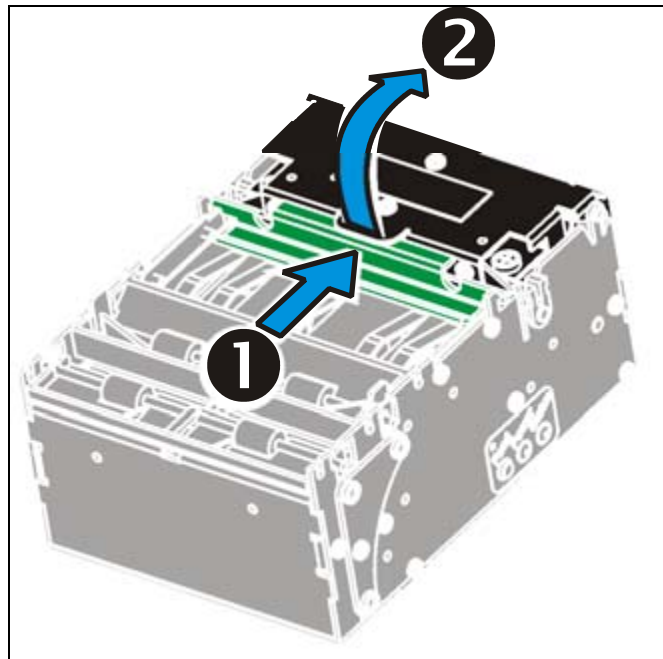


Figure 5. Opening the printhead

3. Remove any paper trash and close the printhead.

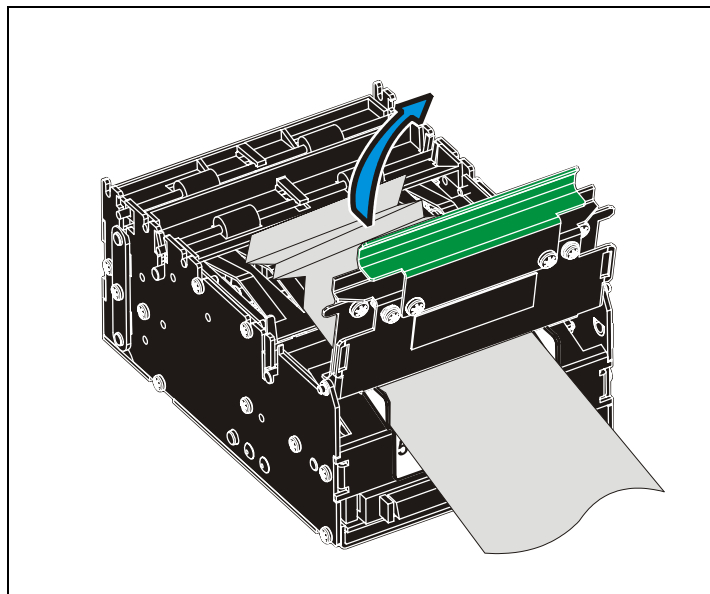


Figure 6. Remove paper trash

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## 4            **DEFAULT PARAMETER SETTINGS**

Some of the printer settings can be stored in the flash PROM so that they will be used also after power OFF.

The stored parameter settings are printed out on the self-test printout.

During diagnostics and repair we recommend you to have default settings loaded into the printer to avoid unexpected results.

If a customer demands a specific parameter setup, load those parameters to the printer as a last step of the service.

Parameters can be set with utility programs available on [www.swecoin.se](http://www.swecoin.se)

## 5

**MAINTENANCE****5.1 Fault finding**

In connection with service of the printer it is good practice to remove paper dust and lint from the paper path, cutter and sensor areas. Paper dust, when accumulated, may interfere with printer functions such as optical sensors.

To avoid smudging the paper, do not apply oil on the cutting knife.

Symptom	Suggested actions
Nothing is printed when you press the feed button in self-test mode, but the document is transported, cut and ejected.	<ul style="list-style-type: none"> <li>• Check that the paper roll is turned the correct way with thermal sensitive layer facing up.</li> <li>• Check that the paper used meets the paper</li> <li>• Check that the printhead cable is fully inserted into the connectors at each end.</li> </ul>
Paper jam	<ul style="list-style-type: none"> <li>• Check cutter-home sensor.</li> </ul>
Printer does not work at all	<ul style="list-style-type: none"> <li>• Check that the printhead is closed.</li> <li>• Check that power is supplied to the printer.</li> <li>• Check the function of the paper-out sensor.</li> </ul>
Self-test prints OK, but the printer works strangely in normal operation.	<ul style="list-style-type: none"> <li>• Check that both ends of the interface cable are properly connected.</li> <li>• Application program might be incorrect. Contact system manager.</li> </ul>
No cutting	<ul style="list-style-type: none"> <li>• Check that the connector for the cutting motor is fully seated on the control board.</li> </ul>
Bad cutting (uneven top and bottom document edges).	<ul style="list-style-type: none"> <li>• Switch OFF printer and remove any obstructing paper particles in cutter and presenter modules.</li> </ul>
Inconsistent cutter operation	<ul style="list-style-type: none"> <li>• Check/clean cutter-home sensor.</li> </ul>
Paper is fed straight through the printer. Paper does not loop.	<ul style="list-style-type: none"> <li>• Check/clean presenter sensor.</li> <li>• Check setting of parameter p9.</li> </ul>
Pull detector does not work.	<ul style="list-style-type: none"> <li>• Clean presenter rollers with isopropyl alcohol.</li> </ul>
Missing print or irregular spots.	<ul style="list-style-type: none"> <li>• Paper may be too humid. Let it adapt to ambient temperature and humidity for approximately 24 hours before use.</li> <li>• The paper used might not meet the paper specification.</li> </ul>
White longitudinal lines in the printout.	<ul style="list-style-type: none"> <li>• Faulty print head, replace.</li> </ul>
Faint print.	<ul style="list-style-type: none"> <li>• The paper used might not meet the paper specification.</li> <li>• Clean print head with ethyl or isopropyl alcohol.</li> <li>• Adjust print contrast, see Technical manual</li> </ul>
Strange characters or graphics printed, or any kind of strange printer behavior.	<ul style="list-style-type: none"> <li>• Might be caused by erroneous data sent from the host. Check validity of transferred data.</li> <li>• Check handshaking setup.</li> <li>• Check interface cable.</li> </ul>

Table 1. Faultfinding

## 5.2 Cleaning the print head

The print head can be cleaned without removal.

1. Open the printhead.
2. Clean the heat elements with a cotton swab immersed in ethyl or isopropyl alcohol.

## 5.3 Firmware

The firmware is stored in flash-PROM on the control board. A replacement control board may not contain the same firmware version that you are currently using, so if you replace control board for some reason, upgrade it to the firmware version you want to use.

### 5.3.1 Loading

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**REMEMBER!** – *Always design your kiosk system so that remote upgrade of firmware is possible. If you need to upgrade firmware in the future, the kiosks can be spread over a vast area and upgrade can become very expensive.*

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Fetch the firmware from the Swecoin web site <http://www.swecoin.se>. There you will also find a loader program (Windows™ software) facilitating the loading of the firmware into the printer.

The loader program contains a help file with detailed instructions on how to load the firmware into the printer.

In non-Windows environments, use the following procedure to load the firmware:

1. Send ESC NUL (1BH 00H) to the printer.
2. Wait 0.5 seconds.
3. Send the firmware file to the printer.
4. Wait until the printer buzzes to confirm that the loading is complete (the presenter motor runs for a second).

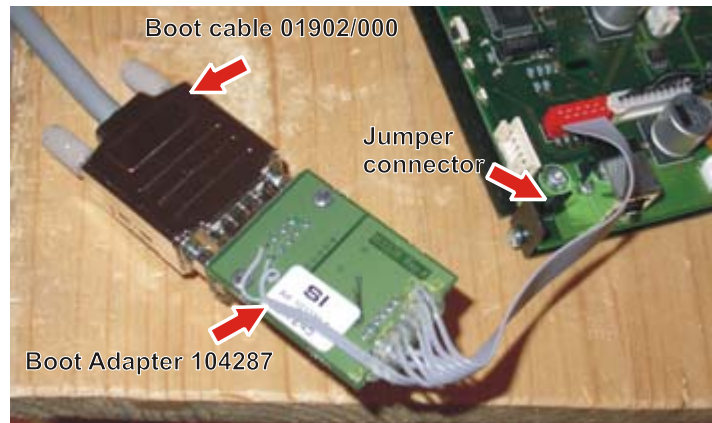
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**CAUTION!** – *The loading and burning can take up to one minute. Do not abort before one minute by turning OFF the power to the printer. Doing so may leave the printer in a state where new firmware cannot be loaded.*

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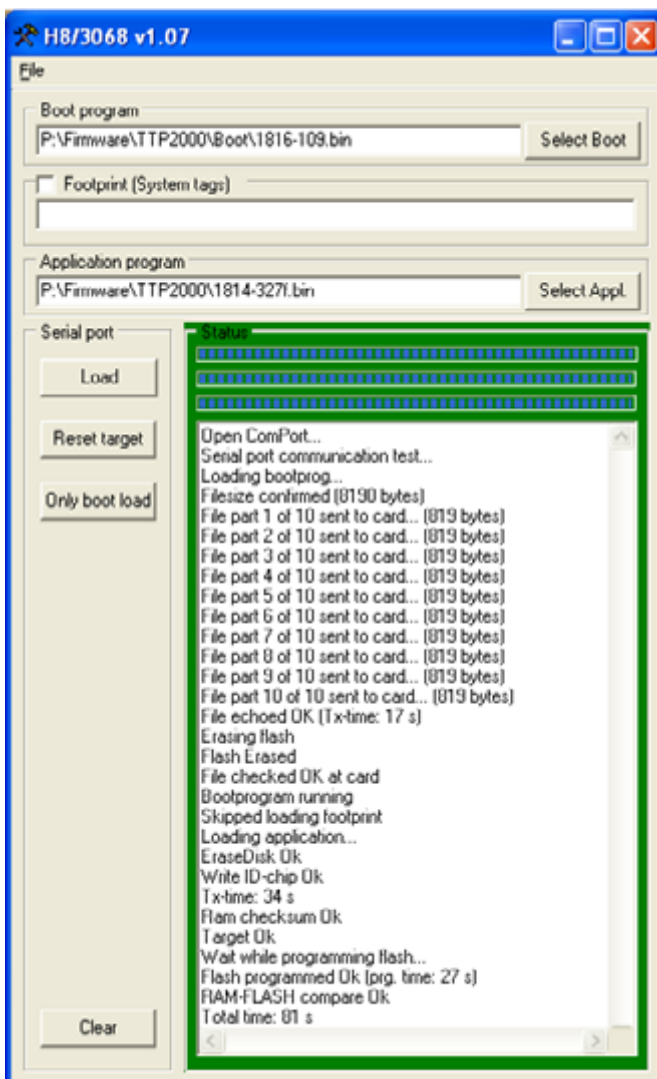
## 5.4 Bootware

The control board uses a small program that we call bootware to start the board and makes it ready to receive firmware. Without bootware the board is dead and cannot communicate. After a proper firmware loading, the bootware is no longer necessary.



To load bootware:

- 1) Connect a jumper to short the pins of connector JMP1 on the control board.



- 2) Connect a serial adapter to control board connector J4.
- 3) Connect the PC to the serial port through a 01902-000 boot cable (this is a normal serial cable but pins 1 and 8 are interconnected in both ends).
- 4) Turn the printer ON.
- 5) Start the H83068.exe loader software.

For TTP 2010

- 6) Select boot file (1817-xxx.bin), and application file (1818-xxx.bin)

For TTP 2020 and TTP 2030

- 6) Select boot file (1816-xxx.bin), and application file (1814-xxx.bin)

- 7) Press the load button
- 8) When loading is complete, remove the jumper from JMP1, and load fonts and set up parameters using for example the TTP editor.



## 6

**REPAIR****6.1 Printhead****6.1.1 Removal**

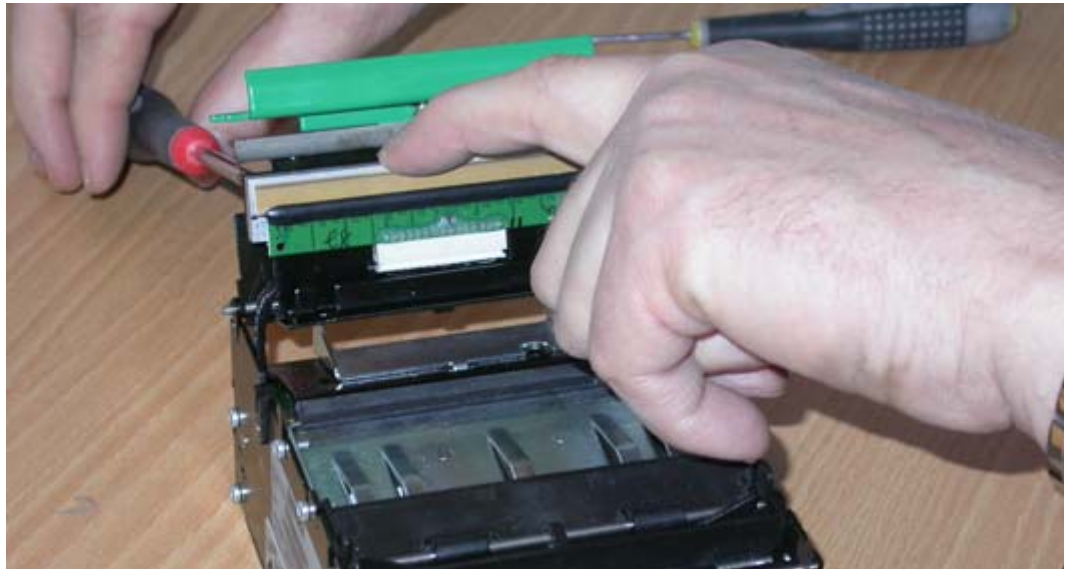
Remove the two screws holding the printhead. Remove the hub that is under the screw on the right hand side.



Use a thin bladed flat screwdriver to pry the connector out from the socket and lift out the printhead.

**CAUTION!** — NEVER pull the cable to loosen the connector. This will destroy the thin leads of the cable!

### 6.1.2 Installation



When fitting the new printhead, remember that the panhead screw is on the paper low connector side and the countersunk screw with it's hub fits on the interface connector side of the printer.

Press the printhead down while tightening the screws.

Make a self test printout to verify that the new printhead works as it should. See also "Adjustments".

## 6.2 Presenter rollers

### 6.2.1 Disassembly



Remove the rear roller guide by pressing the tabs inwards and lifting it up.



Remove the front roller guide by gently lifting it on one side, and then on the next side.

DO NOT pull extensively or you will break the plastic forks that hold the part to the rotating shaft.

To remove the steel shaft and the rollers, gently lift the tab in the center and press the shaft sideways.

### 6.2.2 Assembly

Engage the forks of the front roller guide with the groves in the shaft.

Press on both sides until the part snaps in place.

Put the rear roller guide in place and press it down at one end at a time. Lift the printer in the guide to verify that it is properly fixated.

### 6.2.3 Lubrication

Lubricate the rollers on both sides where the shaft enters the hole in the rollers.

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**CAUTION!** – *The groves and forks should not be lubricated. If they are the retract function of the printer may fail.*

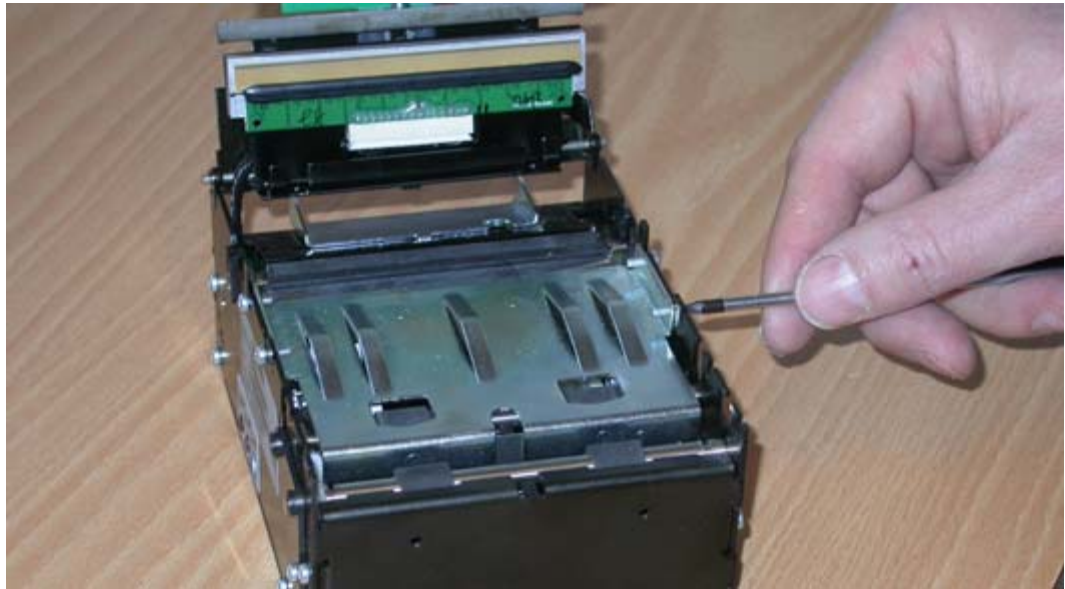
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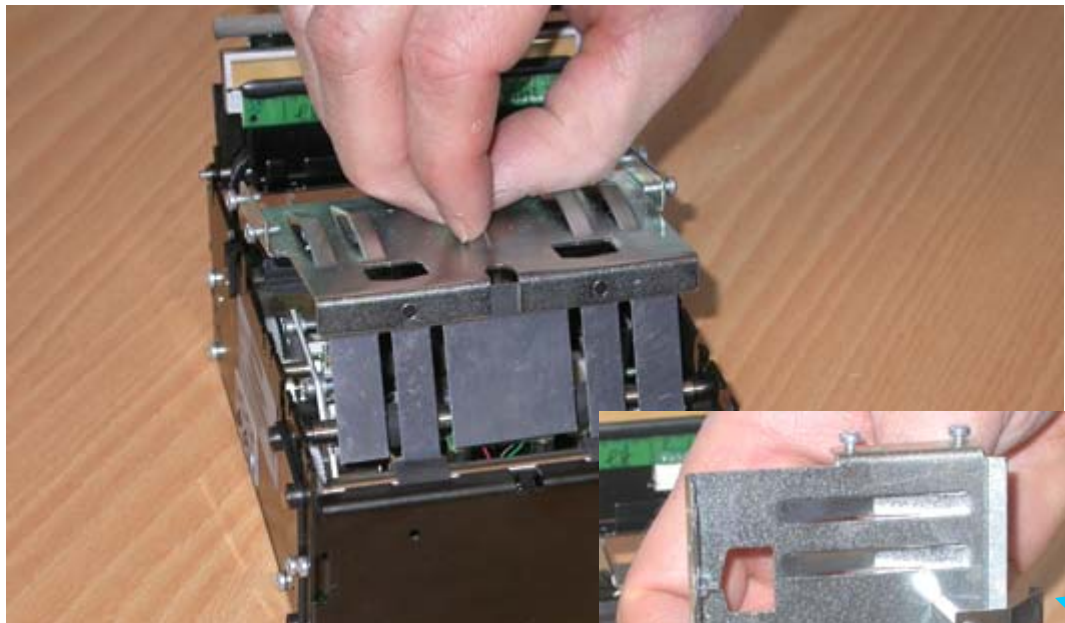
## 6.3 Presenter table

### 6.3.1 Removal

Loosen the four screws on the sides of the printer, you do not need to remove them, just loosen a couple of turns.

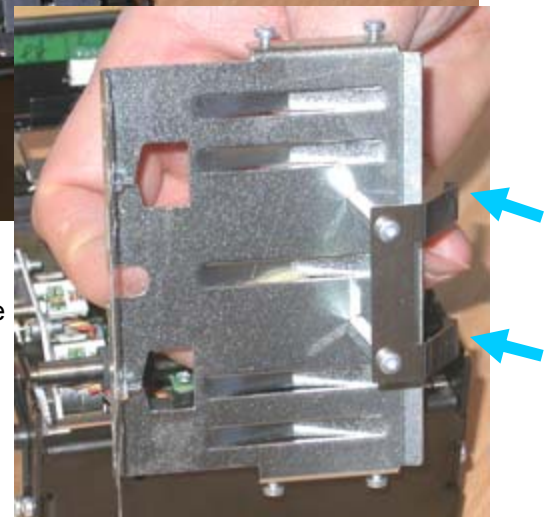


Lift the presenter table straight up to remove it.



### 6.3.2 Replacement

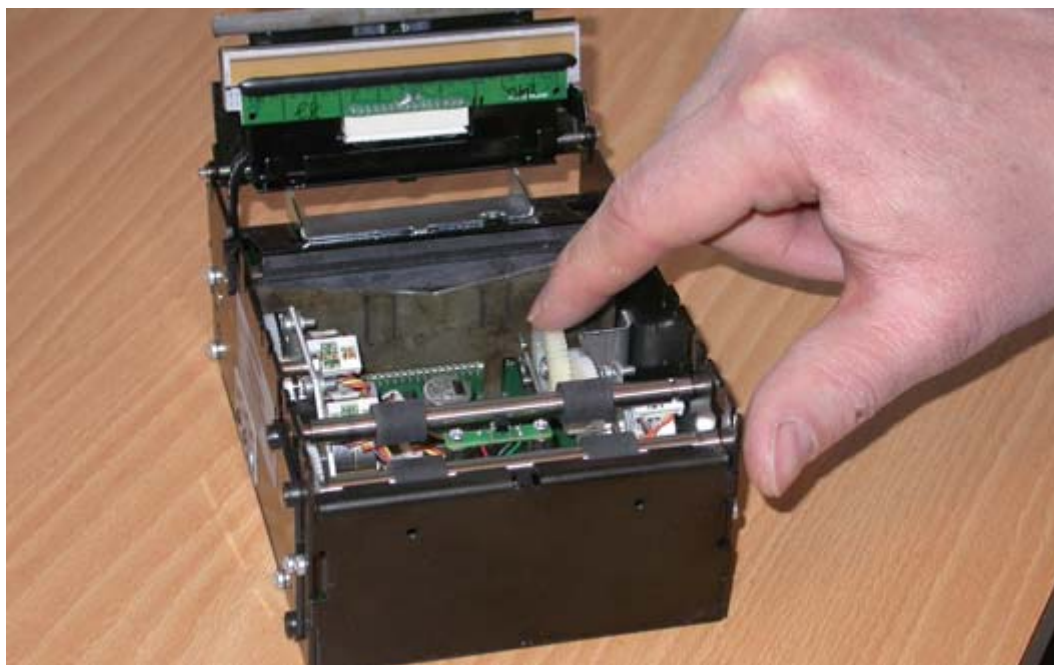
Make sure the tabs of the cutter blade passes the rear edge of the table, press it down and tighten the four screws.



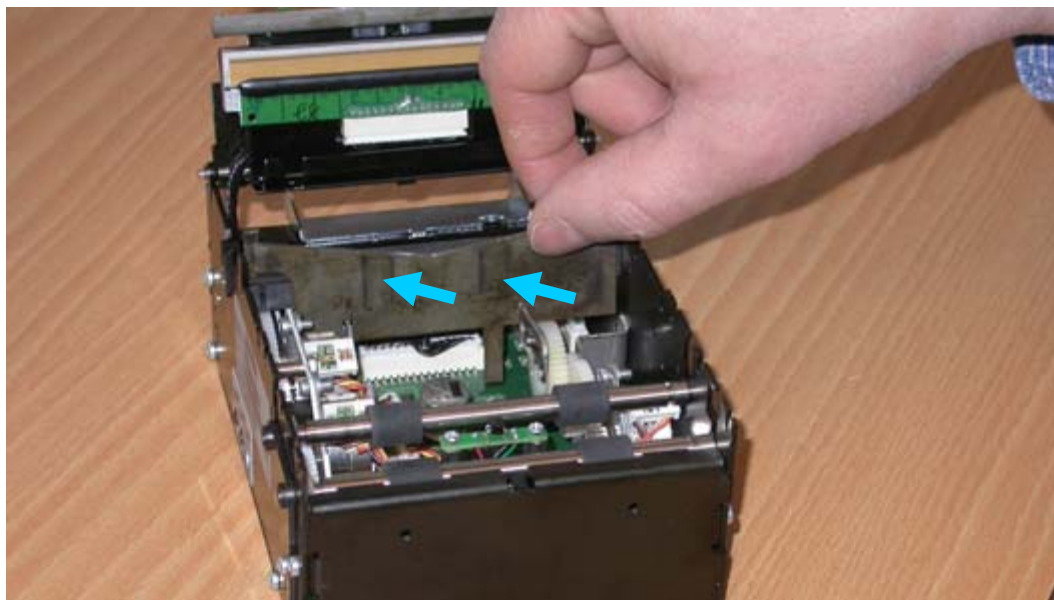
## 6.4 Cutter

### 6.4.1 Removing the moving blade

Rotate the cogwheel with your fingers so that the cutter comes to it's top position.



Grab the blade, tilt it slightly forwards and lift it up from the cutter linkage and take it out.



### 6.4.2 Fitting a new blade

Use Vaseline spray to lubricate the face of the cutter blade where the cutter spring (arrows) touches the blade before putting the table back.

Insert the blade in the slots of the cutter linkage.

Tilt the blade backwards gently and turn the cogwheel so that the blade goes down. Make sure that the tab on the blade enters the hole in the control board.

#### 6.4.3 Removing the fixed blade



Loosen the two screws holding the blade. There is no need to remove them, just open them a couple of turns.

Open the printhead.

Use a flat screwdriver to keep the spring that rests on the blade in place, and remove the blade.

Move the screws to the new blade and install it into the printhead module.

Tighten the screws.



## 6.5 Platen

### 6.5.1 Removal

Press the plastic bearing together with your fingertips while lifting the platen with one finger.



Repeat the above on the other side and lift out the platen and the plastic scraper.



### 6.5.2 Assembly

Make sure the bearings are oriented like on the below photo,



Put the scraper and bearings onto the platen and enter the package into the slots in the side-plates of the printer.

Press firmly downwards until the bearings jumps in place with an audible click.

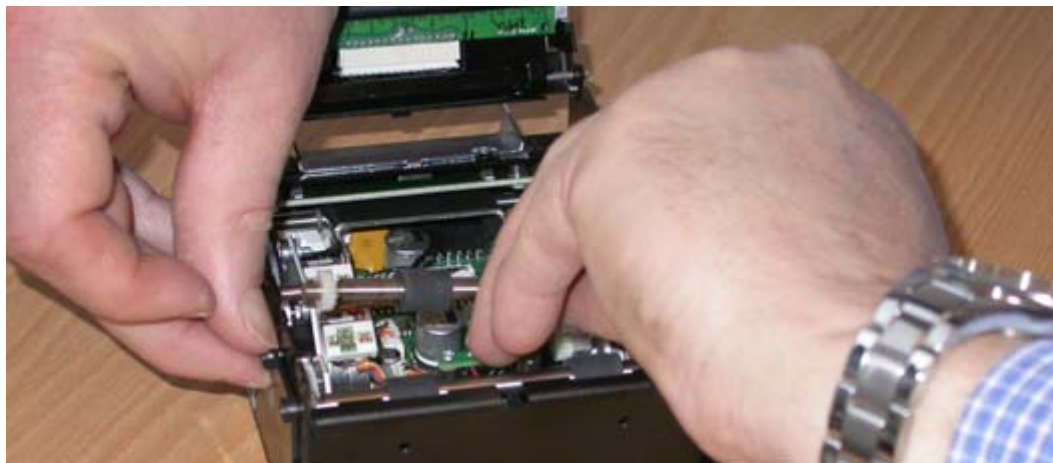




## 6.6 Presenter drive rollers

Bend the bearing plate outwards and lift the roller.

Free the other end of the roller and take it away.



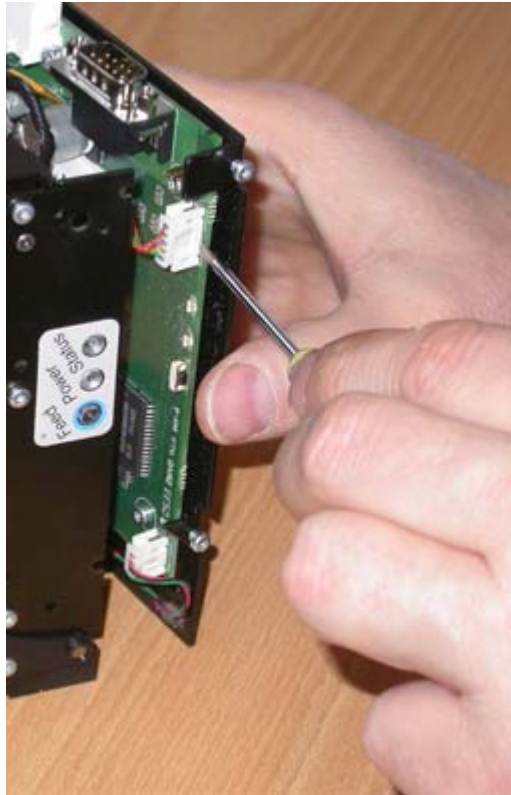
Lubricate the ends of the roller with Vaseline spray before putting the roller back.

## 6.7 Control board

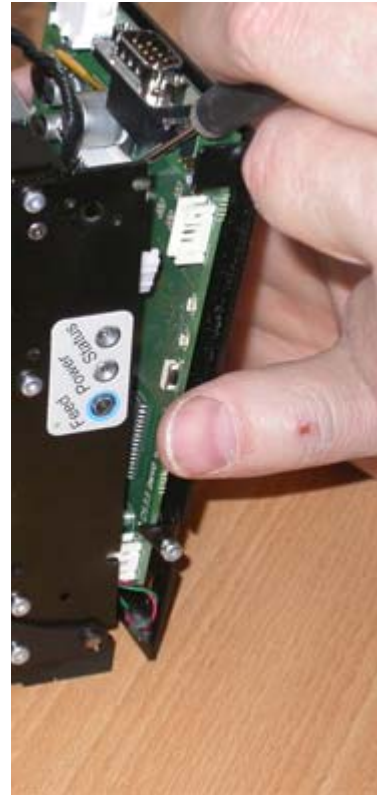
### 6.7.1 Removal



Put the printer on it's front and loosen the four screws holding the bottom plate.



Paperout/TOF- cable



Printhead cable

Gently loosen the bottom plate and then using a thin bladed screwdriver, pry the connectors out from their sockets. You must remove the paper out/TOF sensor card cable, the printhead cable, and the three motor cables.

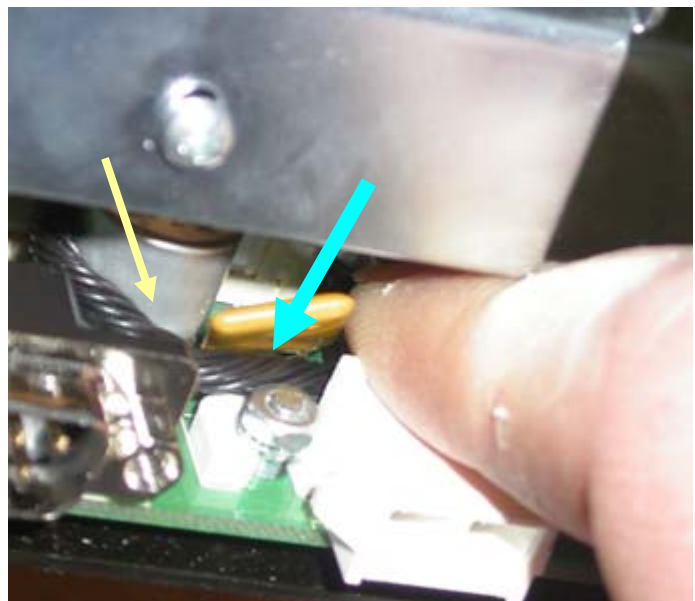
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**CAUTION!** — *NEVER pull the cable to loosen the connector. This will destroy the thin leads of the cable!*

---

#### REASSEMBLY

Route the black printhead cable around the capacitor (thin arrow) and clamp it under the yellow component (wide arrow). This ensures that the cutter link does not hit the cable when it moves.

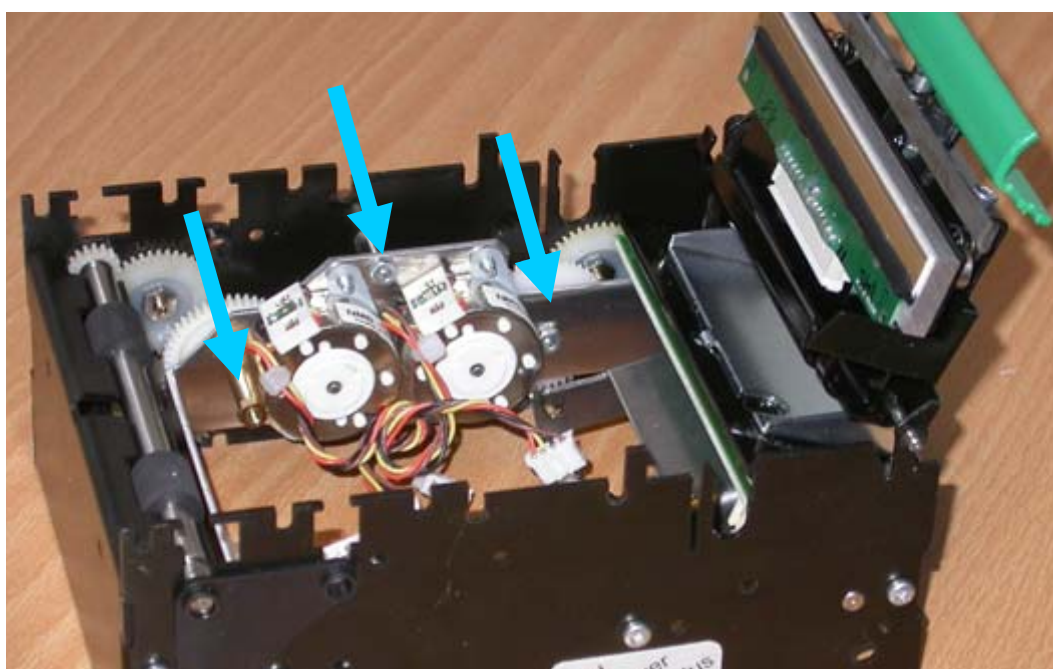


## 6.8 Motors

All three motors are the same so you can use a cutter motor from one printer as replacement part for the presenter motor in the next. To test the windings of a motor that you suspect is faulty, measure the resistance of the coils and verify that they are 16Ω.

On the left side of the printer is a bracket with two motors. The front one is the presenter motor and the rear one the platen motor (print motor). On the right side of the printer is a bracket with the cutter motor.

### 6.8.1 Presenter and platen motor



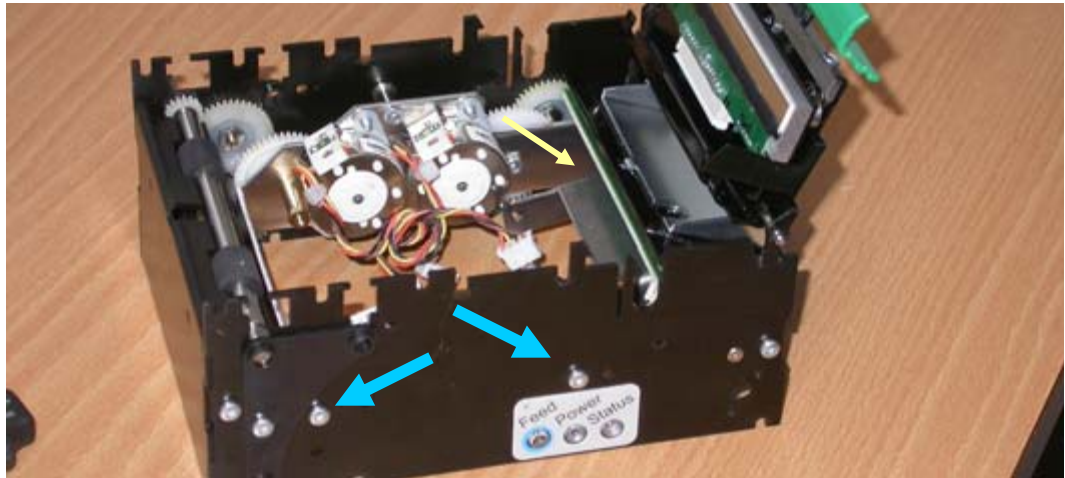
Remove the two nuts and the brass hub using a 5 mm spanner.



Lift the motor assembly out from the printer and remove the motor you are to replace.



### 6.8.2 Cutter motor



#### **REMOVAL**

Remove the C-clip that fixates the cutter link to it's shaft (Thin yellow arrow)

Remove the two screws indicated in the photo above.

Free the cutter link from the tap in the cogwheel

Lift out the motor assembly.

#### **REASSEMBLING**

Reassemble in the reverse order. If the pin that transfers the movement from the cogwheel to the cutter link has been removed, remember to fit it with the longer end into the cogwheel and the shorter end into the cutter link.

Press the cables in under the motors so they are out of the way from moving parts.

Apply Vaseline to the cutter link and cogwheels.



## 6.9 Sensor board, Paper-out

The sensor board located at the rear of the printer under the input guide have sensors that are used to detect the paper with, sense paper out and detect black marks.



### REMOVAL

Remove the screws that hold the rear plate (one screw at each side of the printer)

Lift the assembly out of the printer.

Disconnect the cable using a thin-bladed screwdriver.

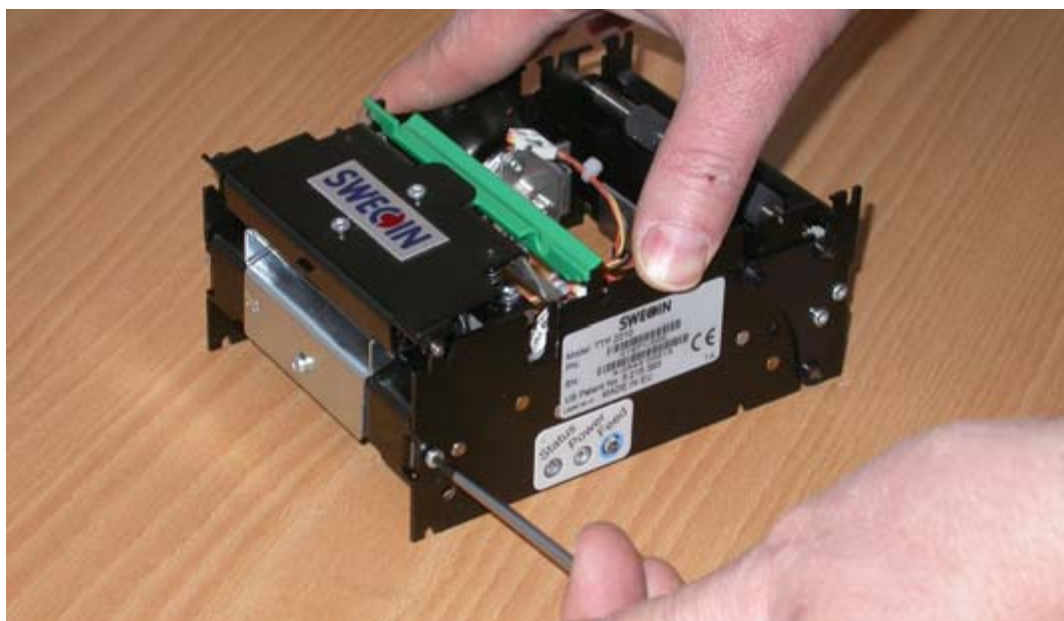
---

**CAUTION!** — *NEVER pull the cable to loosen the connector. This will destroy the thin leads of the cable!*

---

Remove the four nuts holding the board using a 5 mm spanner.

### REASSEMBLY



Put the parts together in the reverse order.

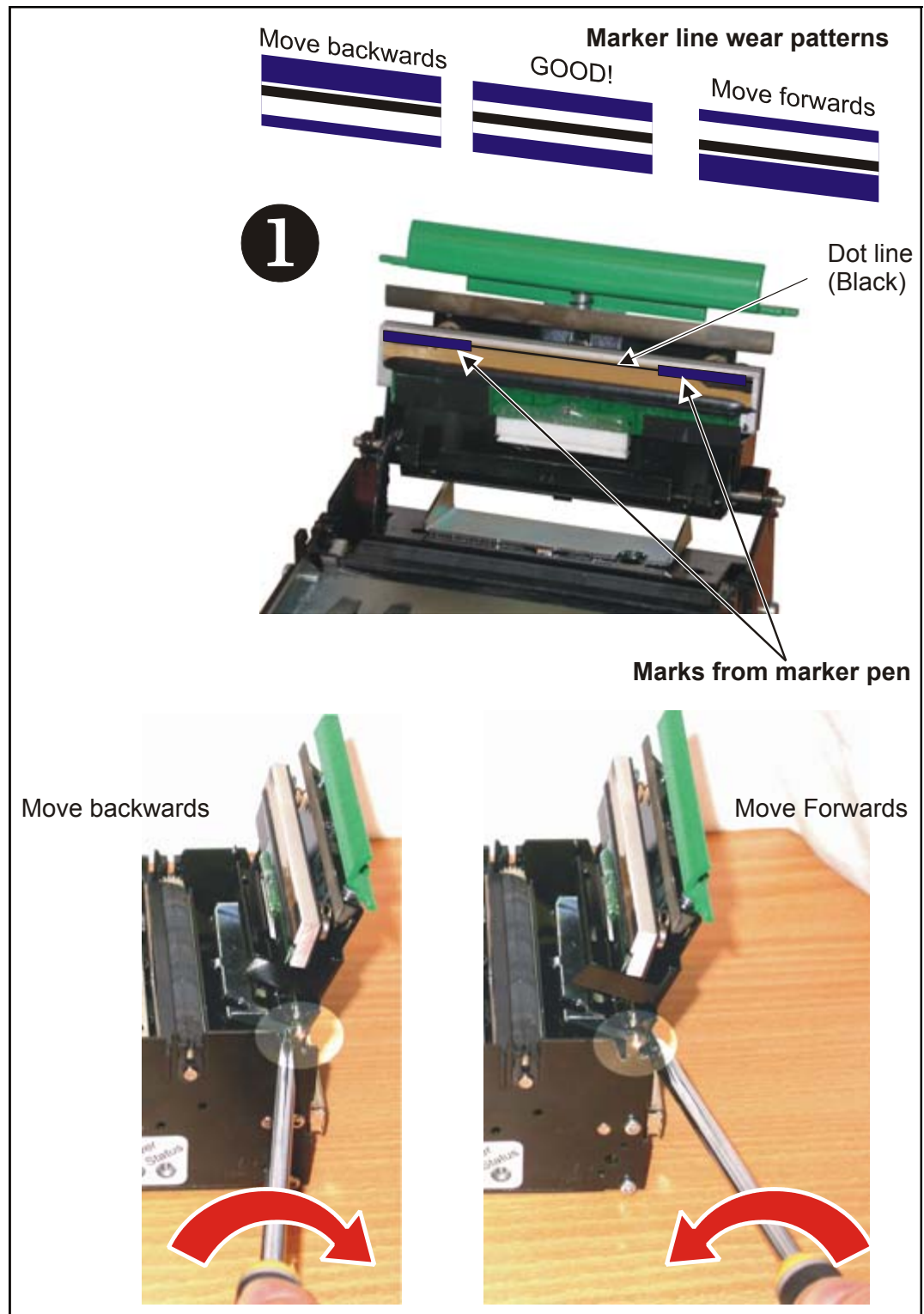
Before tightening the screws, put the printer on a flat surface and press it down while tightening the screws.

## 7

## ADJUSTMENTS

Tolerances in the mechanical design of the Swecoin TTP 2000 are set so that only a minimum of adjustments is required:

- 1) The position of the print line of the thermal printhead was adjusted in the factory. If the printhead is replaced, this adjustment should be verified, and perhaps readjusted.




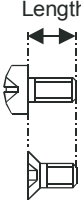



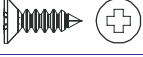





## 8 REPLACEMENT PARTS

Items coded **SP** are standard replacement parts.

1. Screws, washers, nuts etc. are available in a common hardware store, and are thus not supplied as replacement parts.
2. Parts that are considered as not being worn by normal printer use are not replacement parts, for example the printer chassis.

Should you require any of these "non-replacement parts", contact Swecoin for advice. Other price and delivery conditions may apply for non-coded items.

Standard hardware			
Designation example	How to interpret the designation	Illustration	How to measure
Screw MRX-H M3x5	Panhead screw. Thread: M3. Length: 5 mm		
Screw MFX-H M3x6	Countersunk screw. Thread: M3. Length: 6 mm		
Screw M6S M6x16	Hex head screw. Thread: M6. Length: 16 mm		
Screw MC6S M6x12	Allen-head screw. Thread: M6. Length: 12 mm		
Screw FXS-H ST 2.9x6.5	Countersunk. Self-threading. Ø2.9 mm. Length: 6.5 mm		
Screw, RXK-H ST 2.9x8	Panhead screw, Self-threading. Ø2.9mm. Length: 8 mm		
Screw RTK ST 2.9x6.5	Torx panhead. Self-threading. Ø2.9mm. Length: 6.5 mm		
Nut M6M M2	Hex nut, M2 thread		

### DO NOT OVER-TIGHTEN THE SCREWS!

The max torque for the different screw sizes are as follows:

M2 = 0,13 Nm




M2.5 = 0,26 Nm

M3 = 0,46 Nm

M4 = 1.1 Nm

### TOOLS, THREAD LOCKING AND LUBRICATION



Tools	Swecoin Part No.
Screwdriver Phillips No. 1	02542-001
Screwdriver Torx T9	02449-009
Screwdriver Flat blade 2 mm	
Wrench 5 mm	
 Thread lock for screws that hold plastic parts	103650
 Vaseline spray to lubricate moving parts	104237
 Use Dexron II or III automatic transmission oil.	

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Item.	SP	Part No.	Designation	Qty.	
1	X	00375-000	Cog Wheel	2	Pcs.
2		01268-000	Tie wrap 71 x 1.8 mm	1	Pcs.
3		02096-001	Label TTP 2000 Button L	1	Pcs.
5	X	02382-000	Label, "Swecoin"	1	Pcs.
4		02096-002	Label TTP 2000 Button R	1	Pcs.
6	X	09022-309	Nut M6M M2.5	6	Pcs.
7		09045-105	Circlip RS 1.9	2	Pcs.
8	X	09045-107	Circlip RS 3.2	4	Pcs.
9	X	09100-121	Screw MRX-H M2x6	6	Pcs.
10	X	09100-197	Screw MRX-H M2.5x12	1	Pcs.
11		09100-218	Screw MFX-H M3x4	1	Pcs.
12		09101-220	Screw MFX-H M3x6	1	Pcs.
13		09200-188	Screw (TX) MRT M2.5x3	2	Pcs.
14		09200-189	Screw (TX) MRT M2.5x4	2	Pcs.
15		09200-191	Screw (TX) MRT M2.5x6	28	Pcs.
16		100060	Screw MFX-H M2x6	2	Pcs.
17		100479	Screw MFX-H M2.5x12	1	Pcs.
18	X	100481	Spacer DRM 2550x4	4	Pcs.
19		101771	Hub	1	Pcs.
20		102938	Bottom Protection	1	Pcs.
21		102947	Rear Plate	1	Pcs.
22		102949	Pressure Plate	1	Pcs.
23		102950	Front Plate	1	Pcs.
24		102951	Motor Bracket	1	Pcs.
25		102952	Stripper	1	Pcs.
26		102956	Hub	5	Pcs.
27	X	102958	Cutter Blade, Moving	1	Pcs.
28		102959	Side Plate	1	Pcs.
29	X	102963	Cog Wheel 0.5x40	3	Pcs.
30	X	102966	Pressure Roll	4	Pcs.
31	X	102967	Pressure Roll Shaft	2	Pcs.
32		102970	Cutter Drive Plate	1	Pcs.
33		102971	Drive pin	1	Pcs.
34		102974	Leaf Spring	1	Pcs.
35		103082	Cog Wheel 0.5x48	1	Pcs.
36		103083	Shaft Cutter	1	Pcs.
37		103084	Cutter Link	1	Pcs.
38		103090	Cog Wheel 0.5x54	1	Pcs.
39		103136	Hub Nut M2.5x4.0x1.6	3	Pcs.
40		103140	Cover Plate Assy	1	Pcs.
41		103142	Guide	1	Pcs.
42		103144	Spacer M2x35.0	2	Pcs.
43		103145	Spacer M2x40.0	2	Pcs.
44		103146	Side Plate	1	Pcs.
45	X	104399	Thermal Printhead with connector	1	Pcs.
46	X	103273	Sensor board Assy TTP 2000-80, PCA	1	Pcs.



= Apply on thread:  
Loctite 243  
Threadlocker,  
medium strength,  
removable, and  
oil tolerant  
103650



= Vaseline spray  
104237

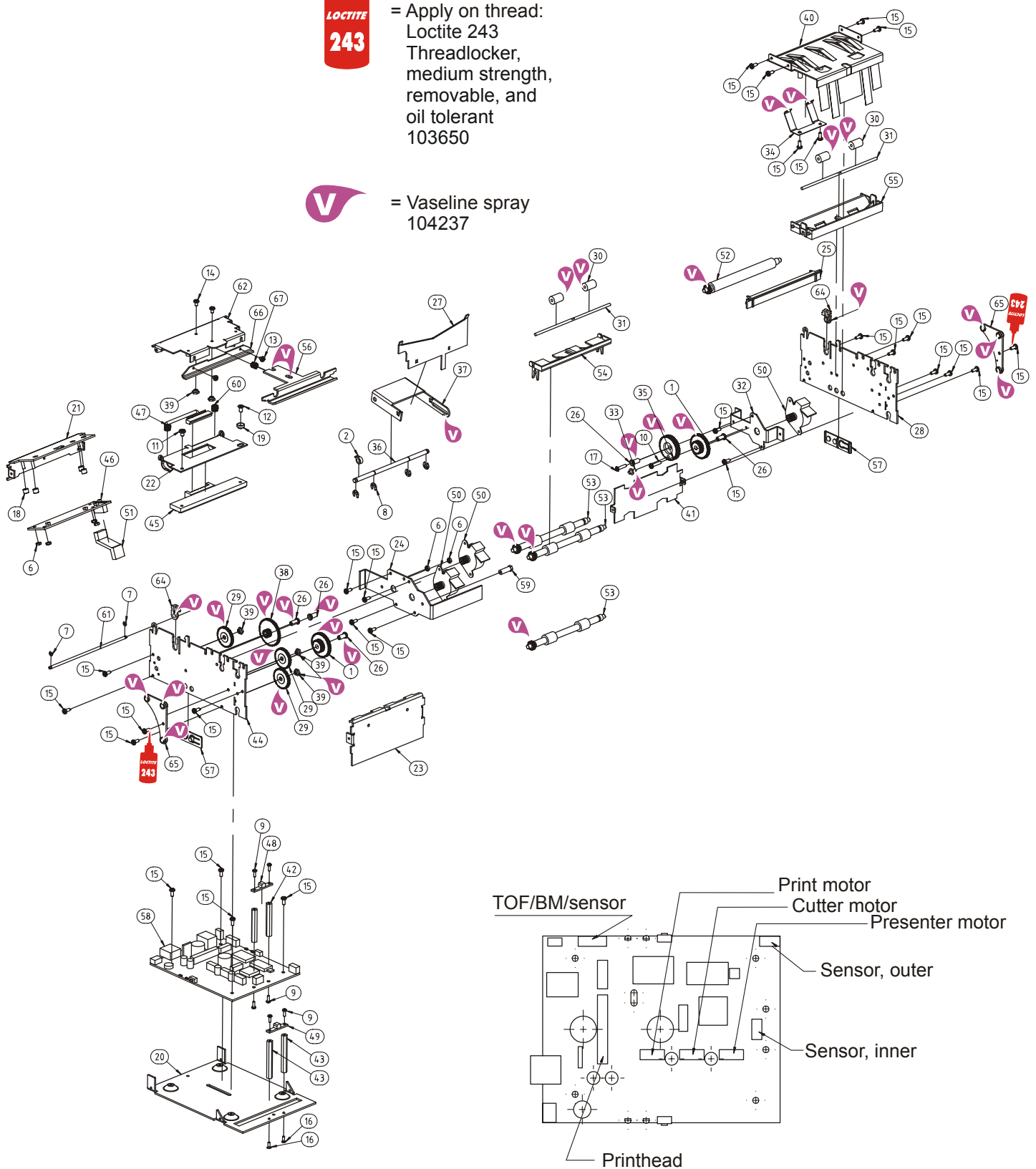


Figure 7. Exploded view, TTP 2000

Item.	SP	Part No.	Designation	Qty.	
47	X	103274	Printhead Cable assy	1	Pcs.
48	X	103275	Opto Sensor Assy, inner	1	Pcs.
49	X	103276	Opto Sensor Assy, outer	1	Pcs.
50	X	103289	Stepper Motor Assy	3	Pcs.
51	X	103306	Cable, Sensor Board	1	Pcs.
52	X	103350	Platen Assy	1	Pcs.
53	X	103351	Feed Roller Assy	3	Pcs.
54		103361	Exit Guide	1	Pcs.
55		103362	Guide front	1	Pcs.
56		103688	Guide	1	Pcs.
57	X	103690	Light Transmitter	2	Pcs.
58	X	102677	Controller Board TTP 2010 PCA	1	Pcs.
58	X	103015	Controller Board TTP 2020, PCA	1	Pcs.
58	X	103716	Controller Board TTP 2030 MKI, PCA	1	Pcs.
59		103725	Hub Nut M2.5x12.5	1	Pcs.
60		103726	Compression Spring SF-TF 0.5x5x9.4	2	Pcs.
61		103747	Shaft	1	Pcs.
62		103748	Cover, Printhead Module	1	Pcs.
63		103845	Label TTP 2030	1	Pcs.
64	X	104029	Bearing, Platen	2	Pcs.
65	X	104030	Bearing, Feed Roller	2	Pcs.
66	X	104032	Cutter blade, fixed	1	Pcs.
67		104097	Compression Spring 0.5x5x9.98	1	Pcs.
Not shown		103848	Complete packaging for TTP 20x0	1	Pcs.



= Apply on thread:  
Loctite 243  
Threadlocker,  
medium strength,  
removable, and  
oil tolerant  
103650



= Vaseline spray  
104237

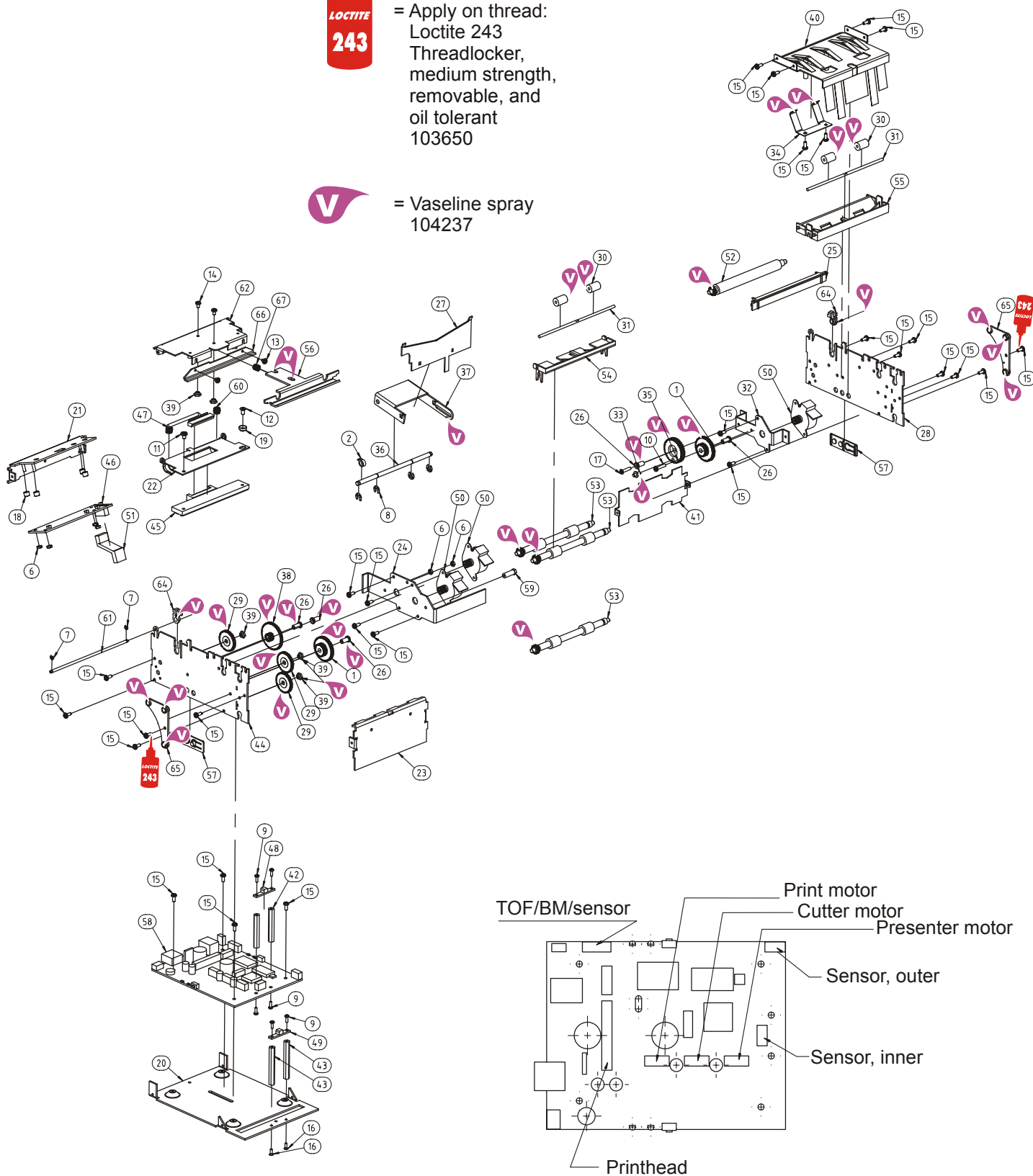


Figure 8. Exploded view, TTP 2000

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## DIAGRAMS

